National Institute of Environmental Health Sciences

Long-term projections and acclimatization scenarios of temperature-related mortality in Europe

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Abstract:

The steady increase in greenhouse gas concentrations is inducing a detectable rise in global temperatures. The sensitivity of human societies to warming temperatures is, however, a transcendental question not comprehensively addressed to date. Here we show the link between temperature, humidity and daily numbers of deaths in nearly 200 European regions, which are subsequently used to infer transient projections of mortality under state-of-the-art high-resolution greenhouse gas scenario simulations. Our analyses point to a change in the seasonality of mortality, with maximum monthly incidence progressively shifting from winter to summer. The results also show that the rise in heat-related mortality will start to completely compensate the reduction of deaths from cold during the second half of the century, amounting to an average drop in human lifespan of up 3-4 months in 2070-2100. Nevertheless, projections suggest that human lifespan might indeed increase if a substantial degree of adaptation to warm temperatures takes place.

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Resource Description

Climate Scenario :

specification of climate scenario (set of assumptions about future states related to climate)

Special Report on Emissions Scenarios (SRES), Other Climate Scenario

Special Report on Emissions Scenarios (SRES) Scenario: SRES A1

Other Climate Scenario: A1B

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure :

weather or climate related pathway by which climate change affects health

Meteorological Factors, Temperature

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Europe

Health Co-Benefit/Co–Harm (Adaption/Mitigation):

specification of beneficial or harmful impacts to health resulting from efforts to reduce or cope with greenhouse gases

A focus of content

Health Impact:

specification of health effect or disease related to climate change exposure

Injury

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology:

type of model used or methodology development is a focus of resource

Exposure Change Prediction, Outcome Change Prediction

Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Elderly

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Long-Term (>50 years)

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content